



Embracing Tablet Technology in Military Construction

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A military construction project is a large and incredibly complex undertaking. It requires enormous individual responsibility, considerable planning and constant, highly effective coordination and communication to complete a military construction project successfully.

The Challenge

The time schedule of a construction site's production environment is extremely tight, and deadlines are often missed left, right and center. Then there are budgetary constraints to deal with, in addition to the necessary coordination between program managers, superintendents and construction supervisors.

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Table 1. Examples of Apps for Construction Projects

BIM

goBIM—This app allows you to view BIM models from your iPad or iPod Touch. It works by using a goBIM exporter with your BIM application to create a .gbm file. Then you load the file onto a web server and access it later from your phone, wherever and whenever you want it.

CAD, Design and Drawing

cadTouch R2—This enables you to draw floor plans, land surfaces (and calculate area and perimeter), facades, mechanical or structural parts (and calculate moments of inertia), diagrams, field notes and more. You can then send drawings instantly via e-mail or FTP.

Finger CAD—This app allows you to draw houses, bridges, plans of apartments, mechanical components, geometrical figures and more using your finger. Final designs can be saved and delivered using e-mail. This could be used by engineers, architects, surveyors and students.

iRhino 3D—You can view native Rhino 3DM files with this app. Using typical iPhone commands, you can pan, zoom and rotate. In addition, 3D models can be loaded from websites, Google Docs, e-mail attachments (iPad only) or from iTunes (iPad only).

Document Viewer

iBlueprint—With iBlueprint, you can create and export custom floor plans. It's handy for homebuyers and real estate agents, but can also be used by contractors for quick access to blueprints on the job site. It can be used on the iPhone (OS 3.0 or later), iPad or the iPod Touch.

LEED (Leadership in Energy and Environmental Design)

LEED AP Building Design + Construction—Similar to iBlueprint, this app is designed to help construction professionals study for the LEED AP Building Design and Construction exam. The app includes 200 flashcards and a 100-question practice exam.

Green Pro—This app gives architects, engineers, owners and contractors the ability to access and track LEED credits for new construction and major renovations. Users can access information about credit requirements and indicate when a particular requirement has been met. The app can be used on the iPhone (OS 3.1.2 or later), iPad and iPod Touch.

PlanRoom

Mobile PlanRoom—This is the first official construction app for iPads. It allows architects, engineers and contractors to access drawings from the field without having to carry paper plans. It is designed to synchronize with www.BuilditLive.com, a Web-based software application that allows project members to share drawings, specifications and other electronic information. The app also works on iPhones (OS 3.2 or later).

Project Management

Procore—This allows users of Procore construction software to create, manage and share Procore project data from their phones. Specifically, users can create and manage punch list items, access contact data, share and store project photos, log time card entries and more. The Procore app can be used on iPhones (OS 3.0 or later), iPads and iPod Touch.

The aforementioned coordination between everyone involved is crucial to the proper planning and completion of the building activities. These activities also need to be balanced with inspections, safety and environmental controls, and the accompanying documentation and follow-up actions pertaining to all work, both ongoing and completed.

Furthermore, these people have to juggle orders for building materials and equipment from within their onsite offices, in addition to dealing with the flow of digital drawings between the design engineers and the architects. At the same time, they send numerous e-mails about pending work to subcontractors, and they draft reports about all deviations from the original construction plan and budget.

Finally, there are the inevitable production meetings at day's end, every day, during which notes are taken, transcribed and e-mailed to every stakeholder in the project. Suffice it to say that for a construction project to be realized, production, use, transmission and storage of a vast amount of information—both reliable and current—is absolutely essential. Further compounding the problem, of course, is the need for a wide range

of software, communication tools and shared storage servers to maintain the flow of said information.

This information is indispensable because it helps solve all or most on-site problems that arise during construction. However, project managers and construction crews have time and again encountered problems and mistakes that occur in the prevalent system, no matter how cautious they are. The challenge, then, is to discover a solution that allows optimum productivity and efficiency during a construction project, with the bare minimum of mishaps, problems, delays and misunderstandings.

The Solution

The recent approval of the *Apple iOS 6 Security Technical Implementation Guide* by the Defense Information Systems Agency has allowed for the development of an environment that supports a wide variety of operating systems and devices, while drawing from multiple vendors. The solution for the construction industry therefore lies in the host of tablet devices currently available from the U.S. Army's CHES (Computer Hardware, Enterprise Software and Solutions)

Program catalog (<https://chess.army.mil>). Each of these tablets is highly capable of being integrated into existing project management systems, having adequately fulfilled the baseline requirements for security, the Trade Act Agreement and environmental protection.

These PC tablets are incredibly effective solutions to the construction industry's woes, as they enable superior real-time management of critical data, thus reducing considerably the time spent on various construction-related activities. In addition, these tablets can incorporate innovative software solutions and apps that project managers find rather easy to use because of their user-friendly design.



Using tablets and appropriate apps, construction site managers have constant access to accurate and reliable data, and can make their decisions confidently with the knowledge that the entire team is using the very same information. They also can use these products to gain access to information about other projects, both past and current.

The Benefits of Tablets

The apps available for PC tablets (see Table 1) offer a range of fundamental benefits that facilitate various aspects of a construction project manager's complex job. Those benefits include the following:

- **Instant Access:** Using apps such as Dropbox and Google Drive, which allow the hosting and sharing of data, the construction crew can instantly access construction documents, including site plans, floor plans, purchase orders, colors and selections.
- **Remote Access:** Tablets allow easy remote access to various kinds of data, such as accounting, estimating, project management systems, purchasing, scheduling and workflow.
- **Remote Meetings:** Construction site personnel no longer need to cross the entire length of a huge site to meet with one another. They can set up face-to-face meetings through video conferencing via apps such as Skype and Apple's Face-Time. This will save time and enhance coordination between builders, suppliers, supervisors and trade partners.

- **Quality Control:** Instant field reports and virtual quality control are now possible, because a superintendent can simply take a problem area's photograph with the tablet's camera and e-mail it, along with notes and plans, to everyone concerned. This should help to identify and address problems at an early stage.
- **Enhanced Efficiency:** The PC tablets streamline the construction project by increasing productivity through constantly effective communication, improving time and budget management, and reducing costs through shorter travel times and the minimizing of errors.
- **Cost Savings:** The benefits from this endeavor will outweigh the overall investment per tablet. Potential cost per unit with apps would be approximately \$700. The implementation of this initiative would decrease project schedule cost by 10 to 20 percent. It's affordable, extremely efficient and can be easily spread out among multiple projects.

Conclusion

A military construction project—equipped with the right PC tablet and the accompanying operation system, software and apps—can be brought to a successful conclusion through minimized risks, proactive management, on-budget costs and within-deadline schedules. This will result in greater value to warfighters and taxpayers, while increasing profitability for the contractors. &

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